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Pascal Daguiet

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EXAMINER

SHEVIN, MARK L

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

09/11/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/593,463	Applicant(s) DAGUIER ET AL.	
	Examiner MARK L. SHEVIN	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1-4, filed June 4th, 2009, are currently under examination. Claim 1 has been amended.

Claim Rejections - 35 USC § 103

2. **Claims 1-4** rejected under 35 U.S.C. 103(a) as being unpatentable over **Badard** (WO 03/012156 A1 – English Machine Translation and PCT written opinion).

Badard:

Badard, drawn to a method for making a steel mechanical component a composition as shown in the table below to a low-pressure carburizing and low-pressure carbonitriding (Abstract and claims 1-5; p. 2, line 11 – p. 3, line 11).

Elements	Claim 1	Badard	Overlap
C	0.19 – 0.25	0.12 – 0.3	0.19 – 0.25
Mn	1.1 – 1.5	1 – 1.6	1.1 – 1.5
Si	0.8 – 1.2	0.8 – 1.5	0.8 – 1.2
S	0.01 – 0.09	0 – 0.1	0.01 – 0.09
P	trace – 0.025	0 – 0.03	trace – 0.025
Ni	trace – 0.25	0 – 0.6	trace – 0.25
Cr	1 – 1.4	0.4 – 1.6	1 - 1.4
Mo	0.10 – 0.25	0 – 0.3	0.10 – 0.25
Cu	trace – 0.3	0 – 0.3	trace – 0.3
Al	0.01 – 0.045	0 – 0.06 (0.008 – 0.05)	0.01 – 0.045
Nb	0.01 – 0.045	0 – 0.05 (0.02 – 0.05)	0.01 – 0.045
N	0.013 – 0.03	0.007 – 0.025	0.013 – 0.025
Bi	opt trace – 0.1	0 – 0.08	trace – 0.08
Pb	opt trace – 0.12	0 – 0.07	trace – 0.07
Te	opt trace – 0.015	0 – 0.02	trace – 0.015
Se	opt trace – 0.03	0 – 0.04	trace – 0.03
Ca	opt trace - 0.0050	0 – 0.05	trace – 0.0050
Fe	Balance	Balance	Balance

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Carburizing Carbo-nitriding –	950 – 1050 °C	950 – 1050 °C	950 – 1050 °C
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Elements	Claim 3	Badard	Overlap
C	0.19 – 0.25	0.12 – 0.3	0.19 – 0.25
Mn	1.2 – 1.5	1 – 1.6	1.2 – 1.5
Si	0.85 – 1.2	0.8 – 1.5	0.85 – 1.2
S	0.01 – 0.09	0 – 0.1	0.01 – 0.09
P	trace – 0.025	0 – 0.03	trace – 0.025
Ni	0.08 – 0.25	0 – 0.6	0.08 – 0.25
Cr	1.1 – 1.4	0.4 – 1.6	1.1 – 1.4
Mo	0.10 – 0.25	0 – 0.3	0.10 – 0.25
Cu	0.06 – 0.3	0 – 0.3	0.06 – 0.3
Al	0.01 – 0.045	0 – 0.06 (0.008 – 0.05)	0.01 – 0.045
Nb	0.015 – 0.045	0 – 0.05 (0.02 – 0.05)	0.015 – 0.045
N	0.013 – 0.03	0.007 – 0.025	0.013 – 0.025
Bi	opt trace – 0.07	0 – 0.08	trace – 0.07
Pb	opt trace – 0.12	0 – 0.07	trace – 0.07
Te	opt trace – 0.010	0 – 0.02	trace – 0.010
Se	opt trace – 0.020	0 – 0.04	trace – 0.020
Ca	opt trace – 0.045	0 – 0.05	trace – 0.045
Fe	Balance	Balance	Balance
Carburizing Carbo-nitriding –	950 – 1050 °C	950 – 1050 °C	950 – 1050 °C

Elements	Claim 4	Badard	Overlap
C	0.20 – 0.25	0.12 – 0.3	0.20 – 0.25
Mn	1.21 – 1.46	1 – 1.6	1.21 – 1.45
Si	0.85 – 1.10	0.8 – 1.5	0.85 – 1.10
S	0.01 – 0.08	0 – 0.1	0.01 – 0.08
P	trace – 0.020	0 – 0.03	trace – 0.020
Ni	0.08 – 0.20	0 – 0.6	0.08 – 0.20
Cr	1.10 – 1.40	0.4 – 1.6	1.10 – 1.40
Mo	0.11 – 0.25	0 – 0.3	0.11 – 0.25
Cu	0.08 – 0.3	0 – 0.3	0.08 – 0.3
Al	0.01 – 0.035	0 – 0.06 (0.008 – 0.05)	0.01 – 0.035
Nb	0.025 – 0.040	0 – 0.05 (0.02 – 0.05)	0.025 – 0.040

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N	0.013 – 0.022	0.007 – 0.025	0.013 – 0.022
Bi	opt trace – 0.07	0 – 0.08	trace – 0.07
Pb	opt trace – 0.12	0 – 0.07	trace – 0.07
Te	opt trace – 0.010	0 – 0.02	trace – 0.010
Se	opt trace – 0.020	0 – 0.04	trace – 0.020
Ca	opt trace - 0.045	0 – 0.05	trace – 0.045
Fe	Balance	Balance	Balance
Carburizing – Carbo-nitriding	950 – 1050 °C	950 – 1050 °C	950 – 1050 °C

Advantageously, this carburizing or carbonitriding at low pressure is carried out at elevated temperature, namely between 950 and 1100 °C, which allows the processing time to be reduced by a factor of 2 to 3 in relation to an operation carried out at 820-930 °C. In these conditions, it is preferable to adjust the composition of the steel so that the grains do not grow too large (p. 4, lines 8-13).

Carburizing or carbonitriding at low pressure (to take a non-restrictive example, at 3 to 20 mbar, or 300 to 2000 Pa), is generally followed by gas quenching, which may also be followed by quenching with another fluid (oil, polymer) (p. 3, lines 31-35).

If the carburizing or carbonitriding is carried out at elevated temperature, the Al content is preferably from 0.008 – 0.05% so that the grains do not grow too large, in conjunction with preferred Nb and N contents (p. 6, para 3).

Adding Nb allows a more homogenous grain size to be obtained, which promotes homogeneity of plastic deformation in use and further minimizes this deformation (p. 6, lines 24-31).

A relatively high nitrogen content, from 70-250 ppm is recommended if carburizing or carbonitriding is carried out at elevated temperature (p. 7, lines 15-22).

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Badard also describes a mechanical part obtained using this method, which is a pinion component.

Regarding claims 1-4, it would have been obvious to one of ordinary skill in steel metallurgy, at the time of the invention, to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists." Badard discloses a steel with overlapping ranges of C, Mn, Si, S, P, Ni, Cr, Mo, Cu, Al, Nb, N, Bi, Pb, Te, Se, Ca, and Fe along with a substantially identical processing method as explained above.

With respect to the Jominy test criteria specified in the claims, if the starting point is substantially identical composition which is subjected to substantially identical heat and thermomechanical treatments, then one of ordinary skill would reasonably expect identical structures and properties to be obtained and thus the average values of the five Jominy tests will thus necessarily be at the intervals claimed in claims 1 and 2. From MPEP 2112, V: "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on '*prima facie* obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required

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with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

With respect to the amendment to claim 1 deleting "the", this amendment does not change the scope of the claims and thus the previous rejections as applied in the Office Action dated February 5th, 2009 still stand.

Response to Applicant's Arguments:

3. Applicant's arguments filed June 4th, 2009 have been fully considered but they are not persuasive.

Applicants assert (p. 6, para 4) that the particular ranges of the present invention are generally narrower and achieve an unexpected result relative to the prior art range. Applicants further assert (p. 7, para 1) that the unexpected result produced is a Jominy curve with no inflection point. Applicants assert that the instant specification provides evidence of criticality of the ranges of C, Cr, Ni, Al, Nb, and N contents. Particular evidence for the criticality of these elements hinge on the comparative results as present in Table 1 on p. 13 and the discussion at p. 14.

In response to the assertion of unexpected results and criticality of C, Cr, Ni, Al, Nb, and N ranges, the Examiner first notes that the evidence presented in the remarks is not in the form of a signed affidavit or declaration See MPEP 716.01(c) II:

The arguments of counsel cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). **Examples of attorney statements which are not evidence and which must be supported by an appropriate affidavit or declaration include statements regarding**

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unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant. (Emphasis added)

However, MPEP 716.01(a) states:

Examiners must consider comparative data in the specification which is intended to illustrate the claimed invention in reaching a conclusion with regard to the obviousness of the claims. *In re Margolis*, 785 F.2d 1029, 228 USPQ 940 (Fed. Cir. 1986). The lack of objective evidence of nonobviousness does not weigh in favor of obviousness. *Miles Labs. Inc. v. Shandon Inc.*, 997 F.2d 870, 878, 27 USPQ2d 1123, 1129 (Fed. Cir. 1993), *cert. denied*, 127 L. Ed. 232 (1994). However, where a *prima facie* case of obviousness is established, the failure to provide rebuttal evidence is dispositive.

With respect to unexpected results, the evidence relied upon should establish "that the differences in results are in fact unexpected and unobvious and of both statistical and practical significance." *Ex parte Gelles*, 22 USPQ2d 1318, 1319 (Bd. Pat. App. & Inter. 1992). "[A]ppellants have the burden of explaining the data in any declaration they proffer as evidence of non-obviousness." *Ex parte Ishizaka*, 24 USPQ2d 1621, 1624 (Bd. Pat. App. & Inter. 1992).

Lastly, evidence of unexpected results must be weighed against evidence supporting *prima facie* obviousness in making a final determination of the obviousness of the claimed invention. *In re May*, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978).

In the present case, the carbon content paragraph cited in the remarks at p. 7 does not state that the Jominy results only occur in the claimed range, but rather that this allows for the desired shape. The endpoints are stated to control hardness, not the Jominy shape.

Similarly the statements at p. 7 of the remarks relating to the chromium content again relate to core hardness, not Jominy curve shape.

The nickel content mentioned in the remarks at p. 8 cannot be said to be critical as the range stated is for costs, not to preserve a particular Jominy curve shape.

Furthermore, the Al, Nb, and N contents mentioned in the remarks at p. 8 do not claim that the claimed ranges are required to produce the unexpected result of a particular Jominy curve.

The Examiner has again reviewed the comparative examples in the specification but Applicants have failed to meet their burden in explaining that the differences in results are in fact unexpected and unobvious and of both statistical and practical significance. One would also expect the alloy of Badard to possess the same thermomechanical properties such as Jominy curve shape, as the composition of Badard overlaps each and every claimed alloying element

Furthermore, the evidence in the specification hinges criticality on the failure of four reference examples (A, B, C, and D) to show an unexpected result with statistical and practical significance as reflected in Table 1 and Figure 1 (particularly comparing curves A-D with curves E-G).

The comparative examples in Table 1 do not feature any control alloys to establish that any one of the purported ranges of C, Cr, Ni, Al, Nb, and N is in fact critical to the production of a Jominy curve with no inflection point. Reference A has Mn, Si, Mo, and N outside of the claimed ranges, reference B has Si and Mo outside of the claimed ranges, reference C has Cr, Mo, and N outside of the claimed ranges, and

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reference D has Cr and N outside of the claimed ranges. How can one demonstrate the criticality of C content when no single comparative example features a C content outside of the range claimed in claim 1? Simply put, there is no evidence of criticality for C at all. Similarly, one cannot say that Cr, Ni, Al, Nb, and N are critical when all these elements are varied at once and no control alloys are used to demonstrate that just Cr or just Ni are producing different Jominy curves.

Lastly, the unexpected result of a Jominy curve with “no inflection point” is not supported by Applicants’ own drawings. Curve G (inventive alloy) seems to have the most pronounced inflection point of all the proffered curves at ~11 mm. Curve F seems to have one at ~10 mm and curve E at ~11 mm. Applicants have not explained how the differences in Jominy curves of Fig. 1 are of practical importance, and if that, how are these statistically significant and commensurate in scope with the instant claims.

In short, Applicants’ assertions of unexpected results and criticality of a number of alloying element ranges is not supported by the evidence presented or the evidence pointed to in the instant specification. More persuasive evidence may be presented in the form of a Rule 1.132 affidavit with additional test results showing – with an explanation of statistical significance – what happens to other alloys outside of the claimed ranges.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

-- Claims 1-4 are finally rejected

-- No claims are allowed

The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588 and fax number is (571) 270-4588. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Mark L. Shevin/
Examiner, Art Unit 1793
September 8, 2009

/George Wyszomierski/
Primary Examiner
Art Unit 1793